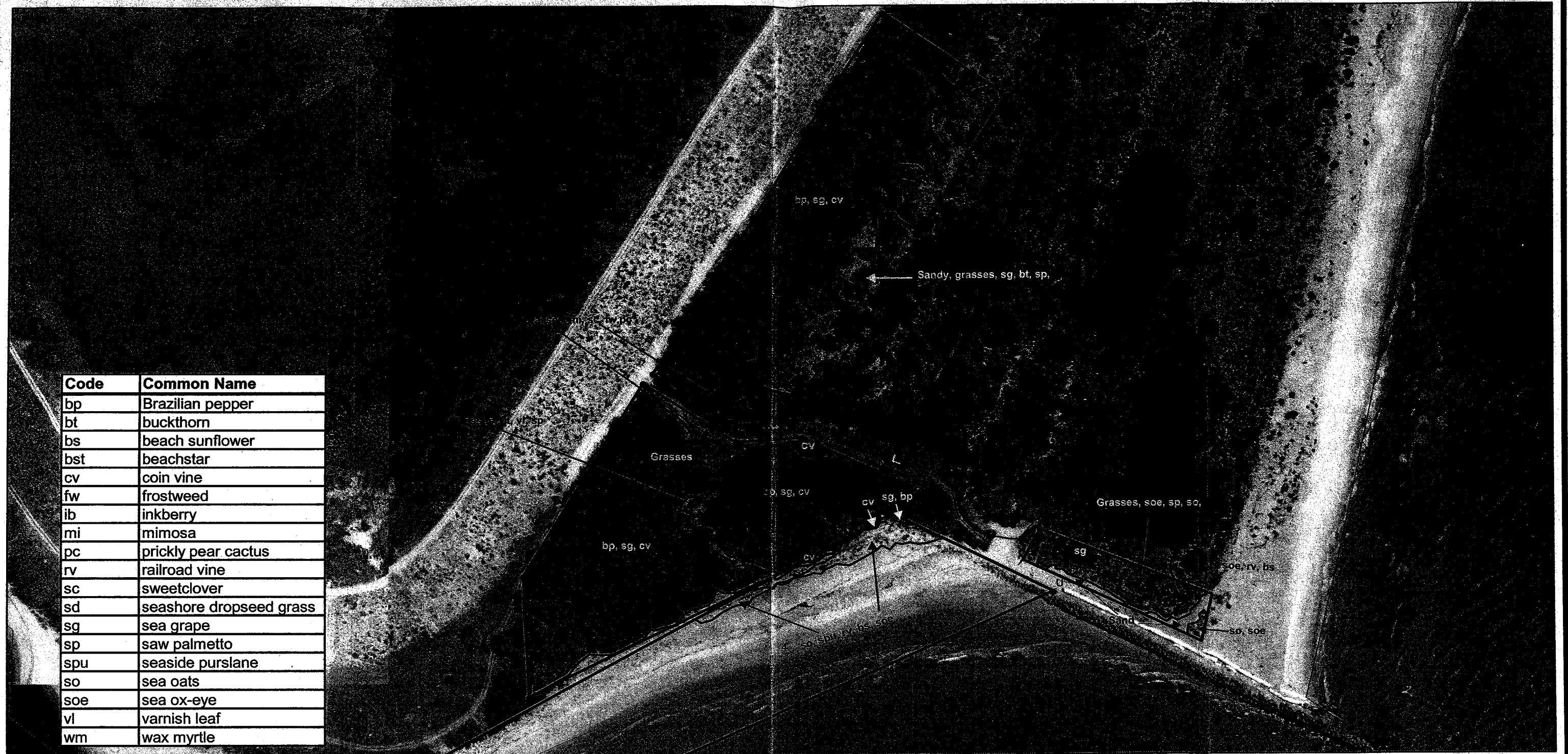


Code	Common Name
bp	Brazilian pepper
bt	buckthorn
bs	beach sunflower
bst	beachstar
cv	coin vine
fw	frostweed
ib	inkberry
mi	mimosa
pc	prickly pear cactus
rv	railroad vine
sc	sweetclover
sd	seashore dropseed grass
sg	sea grape
sp	saw palmetto
spu	seaside purslane
so	sea oats
soe	sea ox-eye
vl	varnish leaf
wm	wax myrtle



1 inch equals 51 meters

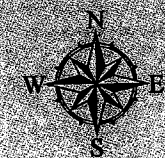
0 70 140 280 Meters

Environmental Site Survey in the Vicinity of the North Jetty at Canaveral Harbor

Vegetation Composition of Staging

Areas 2, 3, 4 and 5

Brevard County, FL



DYNAMAC
CORPORATION

KGB/PGM May 2002

Legend

- Staging Area Boundary Points
- Vegetation Composition
- Staging Areas

Figure 6

colonies and sandy openings were sea grape, some prickly pear cacti (*O. stricta*), cordgrass, saw palmetto, wax myrtle, patridge-pea, and buckthorn. The state-threatened inkberry was also found in and close to the northeastern side of Area 5. Area 5 was comprised of classic coastal dune/coastal strand vegetation.

Refer to Figure 6 for the generalized map of the vegetative composition of Areas 2, 3, 4 and 5. The red vegetative code in Figure 6 indicates identification of a state-listed species in that area.

Vegetation along the section of the jetty access road furthest east, although outside of the defined Areas 3, 4 and 5, may be impacted by heavy equipment during the sand-tightening project. Therefore, for documentation purposes, sea ox-eye, sea oats, seaside pennywort (*Hydrocotyle bonariensis*), cordgrass, and other grasses (*Eustachys* spp. and *Andropogon* spp.) were observed directly north of Area 4. On the opposite side of the road, bordering the overwash area west of Area 5, a small stand of nickerbean (*Caesalpinia bonduc*) was observed with a transition in an eastern direction into sea purslane, cordgrass, sea oats and marsh grasses (*Sporobolus* spp.).

Summary

The natural resources of concern (flora and fauna) in the various areas were combined in Table 3. The matrix provides a decision support chart for the overall issues by area. Used in combination with the maps it can be used as a tool to determine the area of least impact for the laydown needs. Area 4 and 5 were evaluated in anticipation of needs the USCOE may have for the upcoming assessment documents.

Table 3. Matrix Results for Resources of Concern by Area. Areas 1a, 1, 2, and 3 represent zones of potential use for the temporary lay-down of construction materials.

Area	CPUE mice	Active Gophers	Protected Plants		Wetlands
			<i>R. maritima</i>	<i>O. stricta</i>	
1A	.027	7	N	N	0
1	.068	9	N	Y	0
2	.029	16	N	Y	0
3	.021	10	N	Y	0
4	.097	0	Y	N	0
5	.057	0	N	Y	0

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Appendix I

Gopher Tortoise Mitigation Plan Temporary Upland Stockpile and Staging Areas Associated with the Sand Tightening project at the North Jetty of Canaveral Harbor

Introduction

This gopher tortoise mitigation plan was prepared to allow the U.S. Army of Corps of Engineers (USCOE) to mitigate through relocation, all gopher tortoises located in temporary upland stockpile and staging areas. These areas will be used to support the USCOE's project to sand-tighten and extend the north jetty at Port Canaveral.

The proposed staging areas are located on Cape Canaveral Air Force Station, for which the Air Force holds a gopher tortoise relocation permit (Permit # WR01103). The Air Force requires that all tortoise relocation activities be completed in accordance with this existing permit as well as the Cape Canaveral Air Force Station (CCAFS) Tortoise Relocation Plan. The current permit is assigned to Mr. Clay Gordin, Chief of Conservation and Planning for the 45th Space Wing. Strict oversight of the permit use will be conducted for Mr. Gordin by Environmental Support Contract (ESC) Conservation and Planning staff familiar with gopher tortoise biology and relocation procedures. A list of all personnel conducting gopher tortoise relocation activities for this USCOE effort, and their related experience, will be submitted to the 45 CES/CEV office for approval by Mr. Gordin.

Methodology

Burrow Surveys/Identification

The project impact area will be surveyed by an experienced biologist within 10 days of anticipated site disturbance. In the event construction is delayed after completion of the burrow survey, the affected project area will be resurveyed to ensure any tortoises that have moved into the area are identified. All burrows will be marked using flagging tape, a unique identifying number will be assigned and the location will be marked using a Trimble GPS unit or comparable alternative. Each burrow will be scoped using a gopher tortoise burrow camera; however, results of the camera inspection will not be considered as a conclusive indicator of tortoise presence/absence. Since these cameras are not currently an accepted method for estimating population sizes for permitting purposes and some burrows are impossible to survey reliably with a burrow camera, the results will not be considered the "truth", but used to aide the biologist in making the decisions about burrow occupation and subsequent planning.

Recipient Site Selection and Rationale

There is no centralized tortoise relocation site on CCAFS. The Florida Fish and Wildlife Conservation Commission (FWCC) considers all land within the boundaries of CCAFS to fall under their definition of "on-site". The Cape has been broken up into land units (compartments) for purposes of planning scrub habitat restoration activities. These units are typically used when identifying gopher tortoise donor and recipient sites. The proposed USCOE stockpile and staging areas (donor sites) are not located within any of these compartments; however, the recipient site will be and that compartment will be referenced throughout the remaining part of this document and in subsequent reports.

Since the proposed jetty project is expected to last several weeks, tortoises will be moved far enough away to prevent them from finding their way back to their point of capture. The three recipient sites proposed for use are discussed below in order of preference (see Figure 1). These sites will be surveyed to determine the presence/absence of tortoises occupying that site. If the preferred recipient site already contains a dense population of tortoises, one of the alternate sites will be chosen. When possible, all tortoises will be treated as a group or neighborhood and will be relocated to the same recipient site.

- Choice 1: Compartment 117 is located just over one mile northwest of the stockpile and staging areas. This compartment was restored (cut/burn) in November 01. Due to the density of the vegetation prior to restoration, the number of tortoises occupying this area was low. Restoration efforts opened this area up considerably and ample food and habitat now exists for tortoises.
- Choice 2: Compartment 116 is approximately 1.25 miles northwest of the stockpile and staging areas. This compartment was restored in November 01. Due to the density of the vegetation prior to restoration, the number of tortoises occupying this area was low, except for one narrow section located along the eastern edge. Restoration efforts opened Compartment 116 considerably and ample food and habitat now exists for tortoises.
- Choice 3: Compartment 115 is located approximately two miles northwest of the stockpile and staging areas. This compartment was restored in November 00. Due to the density of the vegetation prior to restoration, the number of tortoises occupying this area was low, with the exception of one linear section along the eastern edge. Restoration efforts in 115 have opened it up considerably and ample food and habitat now exists for tortoises.

Tortoise Capture and Handling

If the biologist cannot confirm that a burrow is inactive and/or discovers the burrow is being utilized by commensals, the burrow will be assumed to be active. Although a burrow camera may be used to help confirm the status, as discussed earlier, the results will not be taken as the actual "truth." Typically, gopher tortoises slated for relocation will be captured using the bucket trap method. If tortoises must be moved quickly, are evading the bucket traps or the daytime